East Valley Astronomy Club

December 1998 www.goodnet.com/~rkerwin/evac/evac.html Scottsdale, Arizona

EVAC Meeting Highlights

November 18, 1998

Don Wrigley, Secretary

The meeting was called to order by President Sheri Cahn at 7:40 PM, with 71 people present, including 9 guests. The club officers and board members were asked to introduce themselves before Sheri went on with the announcements of upcoming events. Important events include:

November 21	**Deep Sky Star Party** at Vekol Road
December 5	**EVAC Christmas Party** hosted by Tom Polakis
December 9	**EVAC Meeting** at SCC swap meet, show & tell, no guest speaker
December 12	**EVAC Local Star Party** at Florence Junction
December 19	**EVAC Deep Sky Star Party** at Vekol Road

The main business of the night was the election of club officers. The results are as follows:

PRESIDENT—Silvio Jaconelli
VICE PRESIDENT—Pedro Jane'
SECRETARY—Tom Mazden
TREASURER—Kathy Woodford
PROPERTIES—Enrico Alvarez
BOARD OF DIRECTORS—Steve Bell, Sheri Cahn, Joe Goss, Lika Romny, Rick Scott, Stan Ferris and Dave Richardson.

Congratulations to all new officers and board members!

New Business: Sheri introduced Steve Mutz, the coordinator for club events at SCC. Steve gave a short summary of his background and experience in astronomy and discussed EVAC's future involvement with SCC.

Show and Tell: Pierre Schwaar showed a short video of a Leonid Meteor trail taken with an image intensifier. Tom Polakis showed slides of the Leonids and gave a very effective slide show set to music.

Main Speaker: The main speaker was Astronomer Brian Skiff who talked about the Asteroid research program at Lowell Observatory.

So far, according to Brian, about 150,000 main belt asteroids have been discovered, and many more await discovery. A main belt asteroid is one which occupies an orbit between the orbits of Mars and Jupiter.

Many asteroids lie outside of the main belt, and when their orbits intersect with the Earth's orbit they are termed Earth Crossing Asteroids or ECA's. It is these

EVAC & Other Events: 1998

	Mtng	Local	DS	Other
Jan	14	17	24	
Feb	11	21	28	
Mar	11	21*	28*	21: EVAC Cookout*
				28: Messier Marathon*
Apr	8	18	25*	19-26: Texas Star Party
				25: Sentinel Star Gaze*
May	13	16	23	2: Astronomy Day
				22-25: Riverside TMC
June	10	20	27	13-20: Grand Canyon SP
				19-20: Verde Valley AF
				27-28: Universe '98
July	8	18	25	24-25: Stellafane
Aug	12	15	22	
Sep	9	12	19	11-13: Astrofest
				18-19: N AZ Star Party
Oct	14	10	17*	16-18: Starry Nights Fest
				17: All-AZ Star Party*
Nov	18	14	21	
Dec	9	12	19	

Earth Crossing Asteroids that pose the greatest threat to our existence, and numerous programs are under way to locate and calculate the orbits of all ECAs that are large enough to pose such a threat.

Under the current programs, astronomers are discovering about 30 ECAs per month. However, they estimate that there are about 10,000 ECAs to be found. Since there are not nearly enough funds available for professionals to carry out the needed observations, they are turning to amateurs for help. Most of the amateurs involved live outside of the U.S. and are using CCD equipment with telescopes ranging from 7 to 11 inches in aperture. However, if the budget allotted to ECA research were set at $10 million per year, they would all be found in 10 years.

EVAC Adopt-a-Highway Cleanup

Silvio Jaconelli, President

The autumn EVAC Adopt-a-Highway clean up took place on Saturday, October 31—Halloween day!

The turn-out was better than usual—we had 12 members make the journey to Florence Junction, some of us having to get up before dark to make the 8 AM start time. The flip side of that coin was that it was a beautiful day for this kind of activity—the temperature never got even close to 80°, and the sun just did not have its usual burning power.

The 12 members who volunteered their time—please excuse any typos—included Art Zarkos, Jim Weisenberger, Jon Christianson, Anne Beeby, Bernie Sanden, Angie Soto, Sam Herchak, Tom Polakis, Frank Honer, Len Austin, Jack Schroeder, plus myself. And a special thanks to Sam for leading the east crew.

These clean ups are becoming easier as we keep persevering with the twice a year schedule and as we continue to pick up older debris from years long past! We divided into two parties, an east and west group. We started out at 8 AM and we were finished by 11 AM. A quick count on the drive back to Apache Junction came to 20 bags—pretty good!

The transparency of the air that day was excellent, providing some beautiful views of the Superstition Mountains off to the north—just breathtaking. I stopped several times for a minute or two each time just to admire the wonderful rugged Arizona landscape.

At 11 AM we all formed a convoy and headed to Village Inn at Apache Junction for a really nice lunch. Randy Petersen—an EVAC member—is the manager there, and we all admired the Halloween tie that he was

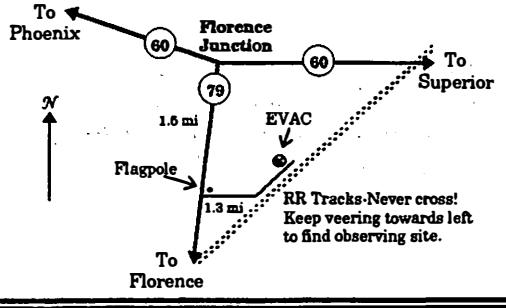
EVAC Star Parties

Local Star Party: Florence Junction Site

General Information: The Florence Junction site is the official site for the East Valley Astronomy Club's Local Star Party, typically held on the Saturday closest to Last Quarter Moon. Florence Junction offers reasonably dark skies within a short drive of most east Valley locations.

Location: N 33° 14' 40" W 111° 20' 16"

How To Get There: Take US 60 east to Florence Junction. At Florence Junction, turn right (south) on SR 79. After 1.5 miles, you will see a tall steel flagpole and a dirt road to the left. Turn left onto the dirt road and continue for another 1.3 miles. Drive with caution as the road is rough in some areas. To the left there will be a large open area.

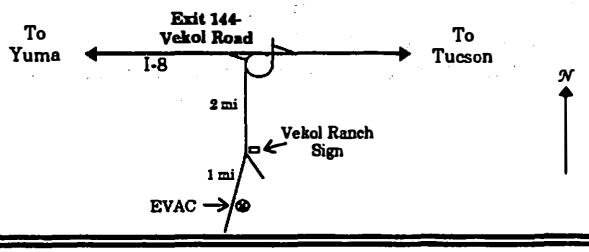


Deep Sky Star Party: Vekol Road Site

General Information: The Vekol Road site is the official site for the East Valley Astronomy Club's Deep Sky Star Party, typically held on the Saturday closest to New Moon. Vekol Road offers dark skies despite prominent skyglow from Phoenix to the north. The site is within 1½ hours drive time from most east Valley locations.

Location: N 32° 47' 55" W 112° 15' 15"

How to Get There: Take I-10 south and exit onto Maricopa Road. Continue through the town of Maricopa to SR 84, about 25 miles from I-10. Turn right on SR 84, after about 5 miles the road merges with I-8. Continue west and exit I-8 at Vekol Road—Exit 144. Turn left and cross the highway overpass. Before looping back onto I-8 take the dirt road to the left. Go south for 2 miles. At the Vekol Ranch sign bear right and continue south for another mile until reaching a large, open area on the left.



wearing that morning! A very leisurely lunch followed, where most of the talk was about telescopes (what else!) and it was not until around 1 p.m. that we broke up and headed home.

Just another wonderful experience!

What a Night!

Bill Peters, EVAC
bpeters@asu.edu

It was an awesome night of observing Leonid meteors, November 16-17! What was most interesting were the VERY long trails between 12:00 and 12:45 a.m. The Leonids were skimming the Earth's atmosphere as the radiant just cleared the horizon. Several had trails at least 120°. You could actually see them slow down before they faded out.

The meteor count is updated to give half hour counts when possible:

Times MST a.m.	Half hour	Hourly Total
12:38-1:00	30	≈80
1:00-1:30	57	
1:30-2:00	54	110
2:00-2:30	104	
2:30-3:00	97	191
3:00-3:30	131	
3:30-4:00	126	257
4:00-4:30	127	
4:30-5:00	148	275
5:00-5:30	169	
5:30-6:00	139	308†
6:00-6:30	31‡	

†moderate twilight
‡strong twilight

You will note that our top half hourly rate 5-5:30 averaged 338 per hour. Our top full hourly rate, from 4:30-5:30 a.m., was 317.

We observed the final meteor at 6:28 a.m. through clouds with a blue sky background.

Marge Williams, Jack Jones, Aaron McNeely, myself, and a couple from Kansas City, Missouri observed numerous -2 and brighter meteors that left trails which remained for at least five seconds. About a dozen brilliant meteors above -5 and two or three -8 left trails, the longest lasted 20 minutes. Through binoculars (and the telescope) the trails were long hollow tubes that bent and twisted in the upper atmosphere. In one case the trail circled around and formed a complete loop. It was a great optical illusion. There were several point source meteors seen. By far the best was about 5:20 a.m. It was a brilliant -2.5 point in Leo's sickle that at first was mistaken for a very slow moving satellite. It brightened to a brilliant blue dot, then left a point source trail.

Along with the Leonids we saw quite a large number of Taurids (15-25 per hour) and a moderate number of Monocerids (5-15 per hour). During one 8 second period we saw 5 Taurids in a burst close to the radiant.

Yes, we also saw the -8, 5:50 a.m. (approximate) fireball. The other two -8 bollides were about 60 minutes earlier crossing Orion and another at about 2:30 a.m.

What a night!

EVAC on the Internet

EVAC Homepage

www.goodnet.com/~rkerwin/evac/evac.html

E-mail Mailing Lists

EVAC-mls is a mailing list for club announcements and quick notification of astronomical events.

EVAC-Board is for EVAC business. All club members are welcome to participate.

AZ-Observing is a fairly general mailing list about observing in Arizona. Included are star party information, who is going, as well as the latest observations and astronomical events.

To join, send E-mail with the "Subject: Subscribe" to the "-request" mailing address at psiaz.com. For example, you would send the request for AZ-Observing to "AZ-Observing-request@psiaz.com"

Backyard Astronomy

Observing Jupiter & Saturn

Silvio Jaconelli, President

The best targets for backyard observing right now without any doubt have to be the dual appearances of Jupiter and Saturn. Hardly a night goes by that I do not haul out my 'scope to look at both of these planets.

December 1998

All Times MST

With glittering gems Orion's belt, his sword, his shoulders, blaze;
While radiant Rigel on his foot pours forth its silver rays.
—*Admiral Smyth*

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 Mercury at inferior conjunction	2	3 	4 SAC Mtng	5 **EVAC Christmas party**
6	7	8	9 **EVAC Mtng** 7:30 pm at SCC	10 	11 Mercury stationary	12 **EVAC Local Star Party** Florence Junction
13	14 Geminid meteors	15	16 E. E. Barnard, b. 1857	17	18  Sun enters Sagittarius	19 **EVAC Deep Sky Star Party** Vekol Road
20 *Ramadan*	21	22 Solstice	23	24	25 *Christmas* Isaac Newton, b. 1642	26 
27	28 Arthur S. Eddington, b. 1882	29	30	31 Robert G. Aitken, b. 1864		

Let's start with Jupiter. Jupiter's moons are fascinating to watch; the moon shadows passing across the planet's surface is probably my favorite event—a stark sharp black dot punching a hole on the planet's colored disk. And waiting for a moon to reappear as it passes out from the planet's shadow is an eerie experience—a slowly brightening light appearing out of the darkness a considerable distance out from the limb. I have also been able to track the transit of a moon across the planet's surface—at Florence Junction on Saturday, November 21 some EVAC members did just that, as Europa crossed over the limb—we tracked it for about 15 minutes; simultaneously, Io on the other side of the planet was moving behind the disk (called an occultation) so we were able to observe two events at the same time. All these events are listed in the national magazines, so look them up and check them out! The cloud bands with their festoons and ovals are also very neat things to look at. However, I have been somewhat disappointed with the Great Red Spot—it seems to be too pale for it to captivate my attention. Jupiter passed opposition a few months ago, so satisfy your viewing requirements quickly before its too late.

Saturn does have moons, but they are very faint and do not have the same captivation as Jupiter's moons. But those rings!!! They are opening up right now and presenting some real neat images. The Cassini division is so obvious, and I generally have no trouble making out the crepe ring, though I only see the faint outer ring as a narrow line at the end on the ring system where it traverses the front of the planetary disk. As Saturn has just passed opposition, you can once again see the planet's shadow on the back side of the ring

Lunar Almanac: 1998

	FQ	Full	LQ	New
Jan	5	12	20	27
Feb	3	11	19	26
Mar	5	12	21	27
Apr	3	11	19	26
May	3	11	18	25
June	1	9	17	23
July	1 31	9	16	23
	Full	**LQ**	**New**	**FQ**
Aug	7	14	21	30
Sep	6	12	20	28
Oct	5	12	20	28
Nov	3	10	18	26
Dec	3	10	18	26

system—check it out. The southern hemisphere has a distinct pink-orange hue. Two features that I have not been able to observe is the Encke Gap, and spokes on the ring systems. Any experienced planetary observers out there willing to write a newsletter article on how to capture these two features?

Let's move on to the equipment that I use for observing the Moon and planets. I use one of two 'scopes for backyard observing, both are reflectors with high focal lengths—F8 and F7.6. The longer focal ratio mirrors are easier to make and therefore you have a better chance of getting a good quality mirror. I also have a 13" F4.6 scope used for deep sky work, but the lunar and planetary images are just not in the same class as the longer focal ratio mirrors. The 10" F7.6 gives better resolution than the 6" F8.0 (aperture is important—you will see finer detail with the larger mirror) but it is a lot heavier and takes a lot longer to reach thermal equilibrium; the larger mirror is also more sensitive to seeing conditions. So I use the 10" for those evenings when I want to settle down to several hours of serious observing, while the 6" is used for those moments when I decide to view something on an impulse or when the seeing is poor.

In my personal opinion, the quality of commercially purchased 'scopes is very variable—I have seen some good ones and I have seen some not so good ones. I would probably have no problem buying large diameter short focal ratio scopes from commercial retailers as most of the ones I've looked through do just fine for deep sky work, but for lunar/planetary/double star work, you really need high quality mirrors, so my preference here is to go to private custom sources for a long focal ratio mirror—there are several local sources for this kind of scope. Are there any ATMs out there willing to write a newsletter article on this subject?

As for scope size, well, I have owned a 4" APO refractor and while the images have been very sharp, the lack of aperture imposed severe penalties in both brightness and resolution that I would not recommend this size for serious observing. I find that the 6" sometimes gives marginal performance (for example, it has trouble finding 10th magnitude companions in tight double stars from my suburban backyard), so 6" has to be my recommendation as to the lowest recommended aperture. The 10" F7.6 is just about at the limit of my physical ability to move it around, so 10" caps the higher side of the aperture limit for me. But would I just love a 16" F8 scope permanently mounted in an observatory! And finally, I have never owned a SCT, but the ones that I have looked through have exhibited very wide differences in quality.

Heavenly Details

courtesy of
The Old Farmer's Almanac 1998
www.almanac.com

December 1998
The Twelfth Month

(all times EST)

Look for **Mercury** in the east before dawn from the 11th to the 26th. This innermost planet floats below the crescent Moon on the 16th and above it the next morning. **Jupiter**, currently the night's most brilliant "star," and bright **Saturn** well to its left are now both high in the sky at nightfall and well placed throughout the night. The Moon keeps Jupiter company on the 24th and passes Saturn on the 27th. The **winter solstice** occurs on the 21st, at 8:56 p.m., EST. While members of the mass media correctly announce this as the shortest day, the earliest sunset occurred two weeks earlier, and afternoon daylight is already growing longer.

FULL MOON: 3rd day, 10th hour, 19th minute
LAST QUARTER: 10th day, 12th hour, 53rd minute
NEW MOON: 18th day, 17th hour, 42nd minute
FIRST QUARTER: 26th day, 5th hour, 46th minute

Maybe we're moonstruck, but we humans seem never to tire of watching the amazing spectacle of the sky. For your interest and edification, The Old Farmer's Almanac provides the dates and locations of solar and lunar eclipses for the year, as well as the days of the full moon for seven years. Check it out at www.almanac.com, *then go outside and look UP!*

For planetary observing, I like to use a blue filter for Jupiter for darkening the Great Red Spot, while a yellow filter seems to sharpen up the cloud bands. For Saturn, I will use yellow to help sharpen up the image and to add a dash of color, but this tends to make both the Crepe Ring and the moons less apparent, so I will use no filter when I want to look at these two features.

I find that Saturn takes higher magnification better than Jupiter (is that because Jupiter has much more fine detail stuff to observe?), so on most nights I use 25X per inch of aperture for Jupiter and 30X per inch of aperture for Saturn. By the way, I can squeeze out slightly more magnification than 30X per inch for the

moon. Occasionally, there are nights of good seeing when I can go higher than this—last night, November 22, I had Jupiter at 300X—that was just magic! And Saturn was a knock out!! Bright, sharp, steady, lots of detail—amazing!

I use mostly Naglers and Panoptics, but the best images that I get are with a 10.5 mm Plössl, which seems to outperform my 7 mm Nagler. Maybe the 7 mm Nagler pushes the magnification limit (my 'scopes do, after all, have long focal lengths, giving high magnification). Anyway, I do so much like the 10.5 mm Plössl that I talked my wife into getting me an 8 mm Plössl for Christmas! I find, however, that the 7 mm Nagler is great on my 13" scope for deep sky work. Are there any club members out there willing to share their experiences with eyepieces?

Both Jupiter and Saturn will soon be well past opposition—so get those scopes out there and have fun!!

In Defense of CATS

Bill Dellinges, EVAC

I see an alarming trend lately to bash Schmidt-Cassegrain telescopes (SCT's). Terms like "A piece of Schmidt" and "Schmidt Catastrophe" are, unfortunately, growing in popularity.

At the heart of the matter is the optical performance (or lack thereof) of such instruments.

The criticism is that a good refractor or Newtonian reflector with a small secondary mirror will outperform a typical SCT. These "catadioptic" telescopes have a somewhat large secondary mirror compared to other types of scopes that result in mushy star images and loss of contrast. A C-8, for instance, has a secondary obstruction 2 ¾" across. This is 34% of its aperture or 11.8% of its primary mirror surface. I'm amazed that you can see anything through these scopes with those huge secondaries mounted on their corrector plates! But they work, and surprisingly well. Nevertheless, I think it's probably true that SCT's come in last, performance wise, after refractors and long focus Newtonians.

But hold on! Optical performance is a relative term. I have seen hundreds of people over the years gasp in amazement at views of Saturn and other celestial objects in my trusty old C-8. Tell them those optics are inferior.

Now, I'll be the first to admit that I've looked at some terrible images in a few SCT's over the years. These poor performers might have been out of collimation, not reached thermal equilibrium, or just plain turkeys—but so too have I seen a few lackluster Newtonians in my time. But I argue that for a general purpose telescope, an SCT is hard to beat. I will never forget seeing M13 for the first time through my C-8 (1974). Instead of the amorphous blob I'd seen in my 4" Unitron refractor, I could actually resolve stars to the core! All this in a 30 pound package I could pick up and move from the house to the yard in a minute. Other attributes: A closed tube (the mirror is still clean as a whistle); A long focal length (2000 mm) rendering higher powers with given eyepieces; The short tube keeps the eyepiece positioned close to a seated observer.

To be fair, it should be pointed out that SCT's on fork mounts are murder to aim at objects close to the north celestial pole. They also have small field of views, about ½° at low power. An F6.3 focal reducer is available from Celestron and Meade for just over $100 that works great, yielding a 1.28-1.66° field of view at 39X with a 32 mm e.p. (50-65° apparent field). With it, I can see all of the Pleiades, or M31 and its two satellite galaxies.

To summarize, I do not hesitate to recommend a SCT to someone shopping for a telescope and feel derogatory references to them are unfair. Just be sure it's performing as well as can be expected for a SCT and in collimation (ask an experienced observer to assess its optics). Return the instrument if it's not up to par. I'm sure Messier would be quite happy with my C-8.

If it's Clear...

December 1998

Fulton Wright, Jr., Prescott Astronomy Club

Shamelessly stolen information from *Sky & Telescope* magazine, *Astronomy* magazine, and anywhere else I can find data.

On Monday, November 30, between 6:00 and 10:00 PM you can watch 7 events of Jupiter's moons. With a medium telescope (6 inch) look 50° above the south horizon for Jupiter. Here is the schedule of events:

6:08 PM	Io disappears behind Jupiter
6:54 PM	Europa disappears behind Jupiter
7:00 PM	Callisto moves in front of Jupiter (only Ganymede should now be visible)
9:27 PM	Callisto moves from in front of Jupiter
9:39 PM	Europa appears from behind Jupiter

9:39 PM Europa disappears in Jupiter's shadow (Europa probably won't show between these events)
9:42 PM Io appears from Jupiter's shadow

On Wednesday, December 9, between 6:00 and 11:00 PM you can watch 6 events of Jupiter's moons. With a medium telescope (6 inch) look 50° above the south horizon for Jupiter. Here is the schedule of events:

6:06 PM Io appears from Jupiter's shadow
6:47 PM Europa's shadow falls on Jupiter
6:47 PM Europa moves from in front of Jupiter (same time, opposite side of Jupiter)
7:38 PM Ganymede moves in front of Jupiter
9:24 PM Europa's shadow leaves Jupiter
10:54 PM Ganymede moves from in front of Jupiter

On Saturday, December 12, around 7:00 AM, you can see Mercury and the Moon. With your unaided eye or binoculars look 13° above the southeast horizon for magnitude 0 Mercury and 5° above it for the thin crescent Moon. A telescope might reveal a crescent phase of Mercury.

On Saturday, December 12, after 7:00 PM you can see five of Saturn's moons in the order of their distance from the planet. With a medium telescope (6 inch) look 50° above the southeast horizon for Saturn at magnitude 1.5. As you approach Saturn from east to west you encounter Titan, Rhea, Dione, Tethys, and Enceladus (also in decreasing order of brightness). The last couple might be hard to see without a bigger telescope.

On Tuesday, December 15, between 7:16 and 10:50 PM you can watch an entire transit of Io (with shadow) in front of Jupiter. With a medium telescope (6 inch) look 50° above the south horizon for Jupiter. The order of events is: Io enters, shadow enters, Io leaves, shadow leaves.

On Wednesday, December 16, between 6:30 and 10:00 PM you can watch 4 events of Jupiter's moons. With a medium telescope (6 inch) look 50° above the south horizon for Jupiter. Here is the schedule of events:

6:43 PM Europa moves in front of Jupiter
8:01 PM Io appears from Jupiter's shadow
9:23 PM Europa's shadow falls on Jupiter
9:24 PM Europa moves in front of Jupiter (almost same time, opposite side)

For Sale

Celestron CG-11, Losmandy mount, digital setting circles, polar alignment 'scope, 2" diagonal, F6.3 reducer, extra counterweight, sure sharp focus, scope cover and dew shield, and two eye pieces—$3,500.

2" rear cell UHC filter by Lumicon, fits all SCT. See the whole loop of Veil, $199 new, yours for $125.

Tuthill 80 mm Ultimate Finder, $395 new. Brand new in box, exact image as Uranometria with erect image diagonal and lens—$295.

9x63 Celestron PRO binoculars—$95.

Jody Humber—Phoenix 602/412-2329 or e-mail at jjhumber@juno.com.

Trade: Wish to trade my (excellent condition) TeleVue 2.5X Barlow for a HIGH QUALITY 1.8X or 2.0X Barlow. Or I will consider purchase of a high quality Barlow if a trade is not available.

WTB: I will pay fair price for a Moon guide that describes IN DETAIL all the lunar features on the near side of the Moon. I already have Rukl's Atlas, and while this SHOWS the lunar detail, it does not EXPLAIN it.

Silvio Jaconelli (Home 926-8529; work 244-4699).

In Astronomical History

December

Dec. 2, 1934: 200-inch Palomar mirror blank cast, Corning, NY.

Dec. 25, 1758: Comet Halley first recovered, after Halley's famous prediction of its return, by German farmer and amateur astronomer Johann Georg Palitzsch.

Dec. 29, 1566: Tycho Brahe lost nose in duel with nobleman Parsberg.

Dec. 29, 1845: Edward C. Herrick observed breakup of Comet Biela, the first such event ever observed.

East Valley Astronomy Club
M. Aaron McNeely, Editor
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Phoenix, AZ 85018

Contents:

Next EVAC Meeting — Dec. 9th 7:30 pm

Valued member since 3/16/97

East Valley Astronomy Club—1998

Scottsdale, Arizona

EVAC Homepage—http://www.goodnet.com/~rkerwin/evac/evac.html

MEMBERSHIP & SUBSCRIPTIONS: $20 per year, renewed in December. Reduced rates to *Sky & Telescope* and *Astronomy* available. Contact Kathy Woodford, P.O. Box 213, Apache Junction, AZ 85217, 602/857-3438. Email—ariz.kat@juno.com

CLUB MEETINGS: Second Wednesday of every month at the Scottsdale Community College, 7:30 pm. Normally Room PS 170 or 172 in the Physical Sciences Building. See map below.

NEWSLETTER: Mailed out the week before the monthly Club meeting. Send contributions to M. Aaron McNeely, 4402 North 36th Street, #22, Phoenix, AZ 85018, 602/954-3971. Email—amcneely@primenet.com Contributions may be edited for length or style.

ADDRESS CHANGES: Contact Bill Smith, 1663 South Sycamore, Mesa, AZ 85202, 602/831-1520. Email—bsmithaz@aol.com

EVAC LIBRARY: The library contains a good assortment of books, downloaded imagery, and helpful guides. Contact Enrico Alvarez for complete details, 602/837-0486.

BOOK DISCOUNTS: Great savings through Kalmbach and Sky Publishing. Contact Don Wrigley, 423 West 5th Avenue, Apache Junction, AZ, 602/982-2428. Email—donwrig@juno.com

EVAC PARTY LINE: Let other members know in advance if you plan to attend a scheduled observing session. Contact Stan Ferris, 602/831-7307.

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